

## ABSTRACT OF THE DISCLOSURE

The invention relates to a time-of-flight mass spectrometer for acquiring spectra of either primary or daughter ions with high mass precision. All the periodic voltage pulse sequences used in the mass spectrometer - in the ion source, and any precursor ion selector or post-acceleration unit -  
5 are run continuously at a fixed base frequency, independently of whether a spectrum is being acquired in the relevant period, in order to avoid any disturbance of the electrical and thermal equilibrium. Ignition delay of the laser after triggering is controlled by switching the output of the clock pulse. The voltage pulse sequences, moreover - once again to avoid settling times - are to be designed in such a way that their voltages and delay times are entirely independent of the mass  
10 of the precursor ions. This feature can be achieved through appropriate forming of the delayed ion acceleration voltage pulse.